Prerequisites for the Master of Financial Economics

Mathematics:
Derivatives of log, power, exponential functions • Interpretation (include convexity, concavity) • Differentials • Integrals • Constrained optimisation: Lagrangian and Kuhn-Tucker conditions • Matrices: adding, multiplying, inverse, transpose, solving linear systems • Implicit function theorem ("implicit derivative") • Homogeneous functions • Taylor series

Statistics:
Density and probability distributions • Expectations, variances and covariances of linear combinations of variables • Normal, binomial, chi-square and F distributions: linkages, uses • Central Limit Theorem • SE of a sample mean • Ordinary regression: simple, multiple, (X'X)^[-1](X'Y) • Testing of hypotheses, confidence intervals, type-I and II errors • t- versus chi2- or F-tests • Power of a test • Autocorrelation • heteroscedasticity • multicollinearity

Micro-Economics:
Indifference curves • Marginal rate of substitution • Budget line • Consumer optimum • Price takership • Perfect competition, monopoly, oligopoly

Finance: fixed interest:
Interest: simple, compound, compound with *n* capitalisations per year, bankers' discount, continuous compounding • Present and future value • PV and FV of a constant annuity • Amortisation table • Yield to maturity • Duration • Term structure, expectations and risk-premium hypotheses

Finance: corporate:
1) capital budgeting and basic principles of valuation: Bonds, shares, hybrids, Cash flows versus profits, NPV, Cost of capital: unlevered, levered, WACC and ANPV; 2) capital structure decisions: MM on the relevance of debt and dividends; corporate tax shield, distress costs • Free Cash flow • Agency problems; 3) some basic principles of accounting: main elements of an accounting system/financial statements

Finance: asset pricing:
Portfolio returns and portfolio weights • Portfolio expected return and variance • Efficient set, tangency portfolio • CAPM • Market model, (un)diversifiable risk • Effect of leverage on equity beta • Efficient markets: concept, limitations, tests • Binomial model for options • Black-Merton-Scholes option pricing • Effect of variance on the option price • Option's delta • Hedging of options • Futures